11-4-2008

101 Ways to Try to Grow Arabidopsis: Do Any Insecticides or Fungicides Burn Foliage?

Robert Eddy
Purdue University, robeddy@purdue.edu

Daniel T. Hahn
Purdue University, dhahn@purdue.edu

Purdue Methods:

Do any insecticides or fungicides burn foliage?

Short answer:

Only a few.

Results:
Over the years, we've observed spray damage on *Arabidopsis* from the following pesticides under certain circumstances:

-Multiple applications of insecticidal soap to the same plants
-Application of insecticidal soap or horticultural spray oil to plants in sunny, hot conditions
-PBO synergist
-Nicotine fumigant only when leaves were wet
-Dursban insecticide
-Pipron fungicide at label recommended rate
-Strike fungicide only at 6X label recommended rate

Below is a list (by US trade name) of some of the products we've applied to *Arabidopsis* without observing damage. This does not mean they are effective in controlling the target pest or to imply an endorsement of the product:

Insecticides, Miticides or insect growth regulators:

Akari
Avid
Azatin
Conserve
Distance
Duraguard
Endeavor
Enstar II
Floramite
Garlic extract
Hexygon
Marathon 1G
Marathon II
Mavrik
Mesurol
Orthene
Ovation
Overture
Pepper extract
Pylon
Sanmite
Talstar
Tame

This document is based on materials originally posted to the Purdue University HLA Department Plant Growth Facility web site: http://www.hort.purdue.edu/hort/facilities/greenhouse/101exp.shtml

Fungicides:

Banrot
Cleary's 3336
Cygnus
Daconil
Strike
Wettable sulfur

Discussion:
Arabidopsis is susceptible to most greenhouse pests such as aphids and western flower thrips. On rare occasions it is fed upon by whitefly, spider mites, root aphids and even armyworms. If the planting is small and the insect population low, a spray bottle of ready-to-use pesticide from a garden center may suffice. In some states, these consumer-friendly products can be applied without restricting the greenhouse entry. Label directions should be followed and a few test plants should be sprayed and observed for phytotoxicity before applying to valuable plants. Spray damage appears in 24-48 hours. Damage from granular formulations added to soil may take up to a week to appear. Another sign of phytotoxicity is the distribution: if all the plants exhibit damage, it is usually not a sign or disease or insects which leave a random distribution. Do not use any product more than twice on the same *Arabidopsis* plants. Insecticidal soaps, for example, accumulate on leaves and may lead to damage only after multiple applications. Also keep in mind that mutant plants may be more susceptible to spray damage, particularly those with altered leaf waxes.

Figure 1. Leaf margin necrosis from Pipron fungicide applied at recommended rate.

Figure 2. From left: Control plants and Pipron fungicide applied at 1x, 3x and 6x recommended rate.

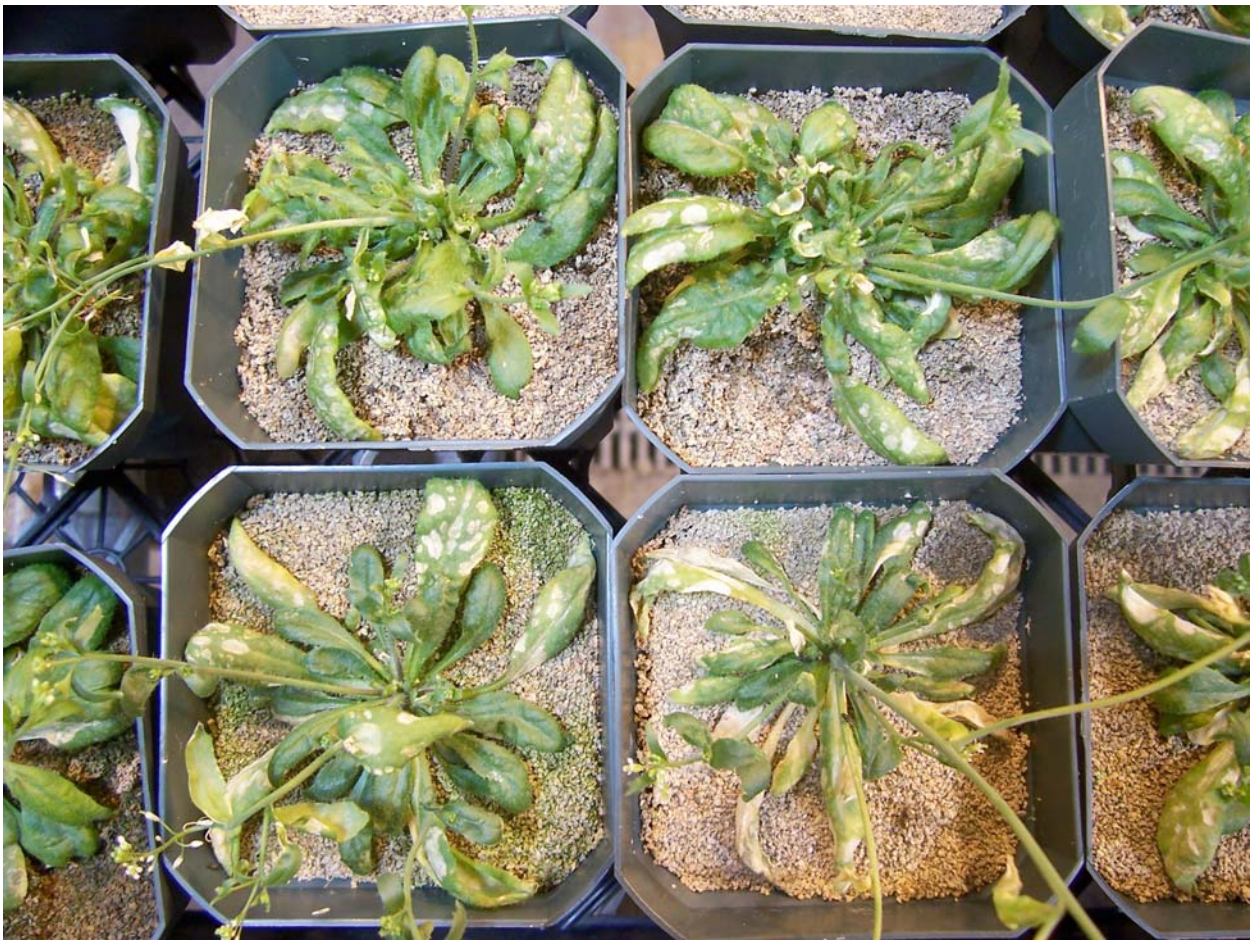

Figure 3. Phytotoxicity from an over-application of Orthene and M-Pede insecticidal soap. We believe it was the Orthene that caused the damage. Note spots on leaves where pesticide drops were.